EXHIBIT A

ROUGH DRAFT DISCLAIMER

THE STENOGRAPHIC NOTES TAKEN IN THIS PROCEEDING ARE BEING TRANSLATED INSTANTANEOUSLY INTO THEIR ENGLISH EQUIVALENT THROUGH AN AUTOMATED PROCESS CALLED REALTIME TRANSLATION. THIS TRANSCRIPT HAS BEEN NEITHER EDITED NOR PROOFREAD BY THE COURT REPORTER.

THE REALTIME DRAFT IS UNEDITED AND UNCERTIFIED AND MAY CONTAIN UNTRANSLATED STENOGRAPHIC SYMBOLS, AN OCCASIONAL REPORTER'S NOTE, A MISSPELLED PROPER NAME, AND/OR NONSENSICAL WORD COMBINATIONS, DEPENDING UPON THE COMPLEXITY OF THE DEPOSITION AND THE SPEED OF THE QUESTIONS AND ANSWERS.

ALL SUCH ENTRIES WILL BE CORRECTED ON THE FINAL CERTIFIED TRANSCRIPT, WHICH WILL BE DELIVERED TO YOU IN ACCORDANCE WITH STANDARD DELIVERY TERMS, OR ON AN EXPEDITED BASIS SHOULD YOU DESIRE FASTER DELIVERY.

DUE TO THE NEED TO CORRECT ENTRIES PRIOR TO CERTIFICATION, THIS ROUGH REALTIME DRAFT CAN ONLY BE USED FOR THE PURPOSE OF AUGMENTING COUNSEL'S NOTES AND NOT TO USE OR CITE IT IN ANY COURT PROCEEDING AS THE ORIGINAL, CERTIFIED TRANSCRIPT, NOR TO DISTRIBUTE IT TO ANY OTHER PARTIES -- CCP 2025.540(b).

BY MR. CHAN:

Q Let me know when you have that document open.

A I have it open on my computer.

Q If you can turn to page 86 --

A 86.

Q -- under the section 5.1.1?

A Sorry. 86 in the document, not in the file.

Okay. I am page 86, 5.1.1.

Q Under section 5.1.1 titled "Construction of Single Acting Cylinder."

Do you see?

A I see that.

Q And it reads:

"Generally, a single acting cylinder is made of the following elements, including two end covers. One may be an integral part of the cylindrical tube."

Do you see that?

A I -- give me one second.

Are you reading the first paragraph under the title?

Q Correct.

A Okay. I see one. Great. Please continue.

Q Now, are you aware of those end covers being part of the housing of the cylindrical device that you were just talking about?

MR. BOWEN: Objection. Asked and answered.

THE WITNESS: Am I aware of them being part of the housing? They're certainly part of the assembly. The definition of a housing might be a little bit vague for me at this point. I see the same -- I see the cross-section that you're pointing out and I see the end covers, and they're certainly part of the assembly. If you want to call them part of the housing, I'm not going to object to that.

BY MR. CHAN:

Q Okay. But here, the definition says: "Two end covers. One may be an integral part of the" -- excuse me -- "cylinder tube."

Do you see that?

A I do see that, yes.

Q Do you have any reason to dispute that definition or assembly?

A No, I don't.

Q If you skip a few lines, it also reads:

"The end covers are fitted to the body by four cover screws or tie rods."

Do you see that as well?

A I see that as well.

Q Do you have any reason to dispute the statements?

A None whatsoever.

Q Dr. Spanos, what shape is the cap generally?

(Simultaneous colloquy.)

MR. BOWEN: Objection. Scope.

Go ahead.

THE WITNESS: Well, I mean, certainly it has what you call the cylindrical symmetry. It's a kind of a form that's created by rotation of a surface, if that's what you're asking. One cap has to have a hole to allow the piston to go through it. If I'm reading this correctly, I think No. 7 is a cap here if I'm reading it correctly.

BY MR. CHAN:

Q Great.

A But please, continue.

Q So the question is actually very simple.

Is the shape of the cap limited to being cylindrical?

A The shape --

(Simultaneous colloquy.)

MR. BOWEN: Sorry.

THE WITNESS: Apologies. I'll give time for objections as we go on.

THE COURT REPORTER: I didn't hear the objection, though.

MR. BOWEN: Objection. Scope.

Thank you.

THE WITNESS: I do not know the answer to that. I'm looking at this particular diagram. This particular diagram doesn't tell me otherwise, that the cap might or might not be cylindrical. It may or may not be. It might have, for example, some indentation for alignment purposes, or it might be a hexagonal on the outside so you can turn it with a wrench.

BY MR. CHAN:

Q So the -- sorry. I didn't mean to interrupt before you finished.

A Air is not gas? Well, it's not a single gas. It's a mixture of various gases, yes.

Q Okay. If the pneumatic cylinder were to be defined as only a gas cylinder, is that a correct construction?

A You mean by that, excluding the possibility of operating a pneumatic cylinder with air?

Q That's right, as only a gas cylinder.

Do you agree with that construction?

A I do not. As an engineer, I think a pneumatic cylinder, depending on the circumstances of applications, can very nicely operate on air as well.

Q Thank you.

Conversely, if a pneumatic cylinder were to be defined as only an air cylinder, is that a correct construction?

A It is not.

Q Dr. Spanos, I recall the specification describes the pneumatic cylinder as having a shaft 49.

Do you remember that?

A Shaft 49? Yes. Are you referring to

figure 2, I presume. Yes.

Q That's right.

A Yes, I do.

Q What does a shaft mean to you?

A Shaft is a -- is a mechanical element. It's usually a rod that is used to transfer motion.

(Reporter clarification.)

THE WITNESS: Yes. Sometimes, this motion is rotational. Sometimes this motion is linear. In this case, I think we're referring to the latter, to linear motion.

BY MR. CHAN:

Q In your opinion, is a shaft the same as a rod?

A No. The two words do not mean the same. But a shaft is usually a rod, but a rod is not always a shaft.

Q What does a rod mean to you, then?

A A rod is generally used to describe a shape which is usually an item that has some length and some diameter. And that's how people would describe it.

Q Is a piston a shaft?

A Not necessarily.

Q Is a piston a rod?

A I don't think engineers will describe it as such.

Q Can I direct your attention back to Exhibit 22.

A Okay.

Q Let me know when you're there.

A On page 87.

Q Let me know when you're there.

A Okay.

Q In figure 5.1 (b), do you see the piston rod labeled as referenced in numeral 11?

A Okay. Yes, I do.

Q And that rod has three portions. The middle portion is the expanded portion with a wider diameter, whereas the portion to the left as well as the portion to the right each have a diameter that is smaller than the middle portion?

Do you agree?

A I do see that, yes.

Q Do you view piston 11 as a rod or a shaft?

MR. BOWEN: Objection. Vague.

describe that shape -- that the trajectory of the stone takes as curvilinear.

BY MR. CHAN:

Q Dr. Spanos, does specification say that the rod of the pneumatic cylinder must travel in a linear path?

A I'm sorry. I do not have a clear recollection of that. Is it mentioned anywhere? I believe the examples are such, but I don't know if it limits it to that.

Q Let me put it another way.

Does the specification say that the rod of the pneumatic cylinder must travel in a straight line?

MR. BOWEN: Objection. Asked and answered.

THE WITNESS: Does it say explicit? Does it say explicitly so? I don't believe that it limits it explicitly in that sense.

BY MR. CHAN:

Q Now, if the rod travels only in a straight line, can it deviate from the center of axis to, say, travel at an angle?

MR. BOWEN: Objection. Vague.

THE WITNESS: Well, in this case, you have to be a little more specific. If the rod is a straight item, it doesn't have a curvature on it at all, and the if the rod is the one connected to the piston inside the cylinder, then, of course, it can only move in a straight line.

BY MR. CHAN:

Q That's what I'm asking. Thank you.

If I can turn your attention to the '651 patents again. If you can go to column 5, line 65.

Let me know when you're there.

A I'm there.

Q Now, it reads:

"A mechanism useful in adjusting the position of the wafer stage 40 may be comprised of any of a variety of devices, such as pneumatic, hydraulic, electromagnetic or mechanical systems."

Do you see that?

A I do.

Q Is there anywhere in this specification that says a pneumatic cylinder cannot combine any of these mechanisms for moving the wafer stage?

MR. BOWEN: Objection. Vague.

THE WITNESS: If I -- let me try to rephrase your question better so I can understand it.

Is there anywhere in the specification that says that you cannot have a combination of multiple modalities on top of a pneumatic cylinder? Is that what you're asking?

BY MR. CHAN:

Q Correct. Yes.

A There is -- there is not a --

(Reporter clarification.)

THE WITNESS: -- specific exclusion of that in this specification, if I recall correctly.

BY MR. CHAN:

Q So in your opinion, can a pneumatic cylinder employ both pneumatic and mechanical mechanisms for moving a wafer stage?

MR. BOWEN: Objection. Calls for a legal conclusion.

THE WITNESS: The term "mechanical device" here, if used, you know, casually, means everything. Spring, piece of metal, screw, a rack pinion, a motor -- all of these -- and pneumatic and pneumatic cylinder. All of these are

mechanical devices. So can you be a little bit more precise?

BY MR. CHAN:

Q Well, actually, that's a good segue into your opinion. Maybe I can refer you to paragraph 44 of your opinion. Let me know when you're there.

A Yes.

Q The last sentence of paragraph 44 -- and it reads -- let me know when you're ready.

It says:

"And the fourth type, a mechanical device, is a device that creates the needed motion through interacting mechanical parts, as, for example, in a rack and pinion configuration."

Do you see that?

A I do.

Q You're not limiting mechanical parts to only rack and pinion configuration; right?

A No. I need to give you a longer explanation of that. Because again, context matters.

In the previous question, you used "mechanical device" in a very general sense. And

I explained to you that in a very general sense, anything is mechanical. Okay? What I mean here in my declaration, I put it specifically in the context of the specification of the '051 patent where they do make -- the inventors do make the distinction, and they make a listing of the devices and they call out mechanical devices -- for example, rack and pinion separately in addition to pneumatic, hydraulic, electromagnetic, and so on. So it is in this context that I use the term "mechanical" here.

Q Where can you point me to the specification -- where do you believe the inventor refers to mechanical as only rack and pinion?

A Well, I can infer that if we go to the bottom of column 5, paragraph -- line 65. They have a list. Pneumatic, hydraulic, electromagnetic -- all mechanical systems. So they clearly use the term "mechanical" as something to mean other than hydraulic, electromagnetic, or pneumatic. So this is the context I'm referring to.

Q Do you see the word "comprised of" in that sentence you just read?

A I do.

Q What does that mean to you?

MR. BOWEN: Objection. Calls for a legal conclusion.

THE WITNESS: It means made of.

BY MR. CHAN:

Q It means made of?

A Uh-huh. In combination for any of these parts.

Q Does your definition of "made of" include multiple of those mechanisms?

MR. BOWEN: Objection. Asked and answered.

THE WITNESS: Yes, it does.

BY MR. CHAN:

Q Okay. Mr. Spanos, I think we talked about the shaft 49 and the valve 61.

Those are mechanical parts; right?

A Yeah. People would describe them as mechanical, correct.

Q So those mechanical parts -- excuse me. Those mechanical parts are used by pneumatic cylinders; correct?

A Sure. Cylinders are made of parts and

people could call those mechanical parts.

Q And are you aware that mechanical parts such as the shaft 49 are used in hydraulic applications?

A Yes.

MR. BOWEN: Objection. Scope.

BY MR. CHAN:

Q I'm sorry. Can you repeat the answer again, Dr. Spanos?

A Yes. They can be used in hydraulic applications.

Q And are you aware that mechanical parts such as the shaft 49, again, are used in electromagnetic applications?

MR. BOWEN: Objection. Scope.

THE WITNESS: Yes. They could be used, even though 49 -- the way figure 2 -- the way it's drawn doesn't show how. But yes, in general, they could.

BY MR. CHAN:

Q In opining on the construction of the term "pneumatic cylinder," did you consider that hybrid pneumatic mechanical cylinders were readily available at the time of your invention?

MR. BOWEN: Objection. Vague.

THE WITNESS: Yes.

MR. BOWEN: Go ahead.

THE WITNESS: Could you please repeat the question.

BY MR. CHAN:

Q Sure.

In opining on the construction of pneumatic cylinder, did you consider that hybrid pneumatic mechanical cylinders were readily available at the time of the invention?

MR. BOWEN: Objection.

THE WITNESS: Yes, I was aware of that.

THE COURT REPORTER: What's the objection?

MR. BOWEN: Vague.

BY MR. CHAN:

Q What are hydraulic cylinders?

A Hydraulic cylinders are devices that use compressed liquid, liquid under some pressure, in order to generate some kind of action, motion, typically.

Q So it is different than pneumatic cylinder in that it uses liquid instead of air or

numerical label, 46, to describe hydraulic cylinders and pneumatic cylinders; right?

MR. BOWEN: Objection. Misrepresents the document.

THE WITNESS: I see they refer to line 50, cylinder -- I'm sorry -- the pneumatic cylinder 46 is referred to in line 48 and 49. And then the same numerical element, 46, is used with the term "hydraulic cylinder" near the bottom of this paragraph. I do see that, yes.

BY MR. CHAN:

Q Have you considered why the inventor used that same numerical label to describe both hydraulic cylinders and pneumatic cylinders?

MR. BOWEN: Objection. Misstates the document.

THE WITNESS: I have.

BY MR. CHAN:

Q And what is your conclusion?

A I think it's probably a mistake in the way this part of the specification is written.

Q Did you consider that the inventor intended that pneumatic cylinder and hydraulic cylinder be interchangeable?

MR. BOWEN: Objection. Objection. Misstates the document.

THE WITNESS: The document does not say that they're interchangeable. If they didn't say that, they do have said so explicitly.

BY MR. CHAN:

Q Are you aware that there were hybrid cylinders that combined pneumatic and hydraulic functions at the time of the invention?

A Yes.

Q In opining on the construction of pneumatic cylinders, have you considered that hybrid -- excuse me. Strike that.

Are you aware that the defendant cited the use of hydraulic actuator in their invalidity contentions as one form of pneumatic cylinder?

A I have not studied invalidity contentions so...

(Simultaneous colloquy.)

BY MR. CHAN:

Q So yo haven't looked at -- so in forming your opinion, you did not look at defendant's invalidity contentions?

A That is correct.

Q Thank you, Dr. Spanos. Let's switch gears to a different patent.

Before we do that, do you need a break? I know we are almost at the hour.

MR. BOWEN: Sorry, Alex. This does seem this might be a good spot because it seems like you might be moving on to a different subject manner.

But, Dr. Spanos would you like to have a break now?

THE WITNESS: Sure.

(Recess.)

BY MR. CHAN:

Q Welcome back, Dr. Spanos. Let's switch gears a little bit to the '538 patent. First, let me ask you just a few foundational question.

Are you familiar with fault detection in semiconductor manufacturing?

A I am.

Q In what capacity?

A Quite a bit of my research work at the university have to do with fault detection in the statistical process, control and advanced process control. And also, in my interactions within the

you don't know if these claims would cover a situation where a fault is 5 percent out of specification, or it would only cover a situation where a fault is only 10 percent out of specification or a situation where a fault is 15 percent out of specification.

Do you see that?

MR. BOWEN: Objection. Misstates the document.

BY MR. CHAN:

Q Go ahead, Dr. Spanos.

A I'll have to ask you to repeat the question.

Q Sure.

What I just read, that is your opinion in your declaration; correct?

MR. BOWEN: Same objection.

THE WITNESS: You read the lines starting, "I do not know, for example"? Is that what you're talking about.

BY MR. CHAN:

Q Correct.

(Reporter clarification.)

THE WITNESS: Everything in my

declaration is my opinion. So I stand by that sentence.

BY MR. CHAN:

Q So is it your opinion that the term "significant" must be quantified to some amount in order to be definite?

MR. BOWEN: Objection. Vague.

THE WITNESS: It is not. As I say here, "for example." So I just gave one example on what type of information might need to be known for classification, but that might not be the only one.

BY MR. CHAN:

Q Now, in your declaration, under paragraph 28 -- if you can go there very quickly.

A Yes.

Q Okay. You said -- and I quote, you:

-- "did not find any disclosure that provides a definition, parameters, or other metrics to determine the boundaries of what is or isn't significant."

And then in paragraph 29, you said that:

"The other example of the word 'significant' being used in the specification is

not related to determining whether a fault is significant."

Now, other than these examples, did you review any other examples in this specification in forming your opinion?

A These examples refer to the entire reading of the specification. When I say that I have reviewed the pattern and not find any disclosure, I mean the entire specification and patent, if I understood your question.

Q Well, in paragraph 29, you said that the other example -- so I want to clarify. That is not -- that is or is not the only example that you have reviewed?

MR. BOWEN: Objection. Vague.

THE WITNESS: What paragraph 29 says is that the term "significant" is used to two different meanings in the specification. One is to -- applying to the significance of the fault. The other applies to the significant contribution of the factor to a significant fault. This is what I'm trying to say in paragraph 29.

BY MR. CHAN:

Q Thank you for clarifying.

process. I need to know a few things about the sensor that measures the pressure and the variation introduced by the sensor and so on and so forth. In other words, these questions can only be answered with lots of details and context about the process in question because this processes are extremely complex and interact with many, many steps.

BY MR. CHAN:

Q So using this example in the background, let's just say the acceptable range of the pressure is between 1 to 10 Psi which is ten times more than -- excuse me, 1 to 10 Psi and let's assume that the pressure sense is 100 Psi. Does that inform you there is a significant fault?

MR. BOWEN: Objection. Scope. Go ahead.

BY MR. CHAN:

Q It does?

A It does not.

Q Let's say the result is 10,000 Psi, which is many more times than the acceptable range.

Is it your opinion that this still is

not significant?

MR. BOWEN: Objection. Scope. Go ahead.

THE WITNESS: It is my opinion that I still would not know whether it is significant or not. Even if it is a medium Psi. The reason being is that you have not determined what is the role of pressure in the process, in this particular process. We have not determined the quality of the sensor that might be producing the results. In order to give you an answer, I need to know many more things and of course, the most important thing is in your question, said, is my opinion that this is a significant fault. You have not defined what significant means. That's why I cannot answer this question.

BY MR. CHAN:

Q Have you ever used the word significant in any context in any of your publications?

A Many times.

Q Used it many times?

And in those occasions, you know why you used that term?

A I certainly hope so.

Q Now, in your -- excuse me. Under paragraph 30 of your declaration -- let me know if you're there. Your opinion is that:

"The term 'significant' is an exact term I would never use if I had to describe the value of this field with reasonable certainty."

Correct?

A Correct.

Q And you just confirmed that you use the term "significant" in your publication; correct?

MR. BOWEN: Objection. Misstates testimony.

MR. CHAN: Let's give an example. If I may ask you to go to one of the exhibits. I'm going to need the court reporter to designate this exhibit and mark it as Exhibit 2. This is the exhibit entitled "Engineering Versus Ambient Type Visualization."

Let me know when you're there.

(Exhibit 2 was marked.)

THE WITNESS: Okay. I'm here.

BY MR. CHAN:

Q Do you recognize this publication?

A I do.

output shown in figure 7."

Do you see that?

A I do.

Q And here, why did you use the term "significant" in describing protection of daily aggregate energy use?

A Because --

MR. BOWEN: Objection. Scope.

Go ahead.

THE WITNESS: Because here it has a specific meaning. And if I direct you to the abstract --

BY MR. CHAN:

Q I'm sorry, Dr. Spanos. You got cut out there again. Can you repeat that answer --

A I use the term "significant" because it has a specific meaning. And if I direct you to the abstract of the paper.

Q Okay.

A You might see that the first -- the first time the words significant appears may be 1-third from the bottom at the beginning of the line, significant reductions. Do you see that.

A Yes.

Q The word proceeding that is statistically significant reductions. In the space where this paper was presented, in fact, in many spaces the word "statistical significance" has a meaning, has a quantifiable meaning.

Q So again, I think that sort of -- but I thought earlier you said -- and you can correct me if I'm wrong -- I said you're not trying to quantify the word significance but here you're saying it's quantifiable.?

MR. BOWEN: Objection. Misstates testimony.

THE WITNESS: Actually --

(Reporter clarification.)

THE WITNESS: Actually, I'm not saying the term significance is quantifiable. I am saying the term statistical significance is quantifiable. The composite term.

BY MR. CHAN:

Q Okay. Let's go back to section 3.2.1. Let me know when you're there. Somewhere in the middle of that paragraph it says a category or the y'all available treating each day of the week as an

independent predictor found four of the five weekdays to have insignificant predictive power with respect to the response. And there's a footnote. Footnote four. It says when we say a predictor was insignificant in predicting a response, we use conventional definitions of 5 percent significance in a frequent ordinary least square (OLS) framework.

Do you see that?

A I do.

Q Now, does the use of the word significance have anything to do with statistics here?

A Are you asking how the word significance is being used in this paper in this instance.

Q I'm only asking -- I'm only asking in the context of this paragraph where it says about insignificance predicted power with a footnote actually defining what it means by insignificance. So my question is does the definition of the word significance or insignificance have anything to do with statistics?

A Only when it was defined in that way. Not in a general sense. If I'm with my friend in

the street and asking if they have anything significant to say or insignificance news, certainly would not be refer to the fact of significance in the frequenttist ordinary square network; right.

BY MR. CHAN:

Q I'm sorry. Can you cut out there. Can can can you repeat one more time for me, please?

A Yes. I'll be glad to.

If I believe here the operation is, if I heard the word significance, should I immediately construe that this is a -- this is a -- referring to a specific formal statistical definition? That's how I understood the question.

Did I understand it correctly?

Q Yes.

A Okay. And my answer is normally, no. If I meet my friend in the street and they tell me that they have some significant use, I will certainly not infer that they used the 5 percent significance level in some kind of statistical framework. I'll take the use of the word to meaning something perhaps important but it's not certainly quantifiable.

Q Okay. Would it be fair to say under footnote four where you define significant to mean 5 percent?

A The 5 percent that you see there is an accurate number but it requires a little bit longer explanation of what it actually means. And I'll be glad to go into that explanation. But it relates to the type one and type two errors in some hypothesis testing. So this item is a bit esoteric. I'll be glad to talk about it if you want.

Q Okay. That's okay.

Dr. Spanos, are you aware that you used the term significant or significantly or insignificant more than 18 times in this article?

A That's quite likely, yes.

Q And do you have any reason to dispute that this term, significant or significantly or insignificance as used by you are not clear as to the meaning?

A No, I disagree with that. This paper is placed in a statistical experimental context. It is -- it says so in the abstract. It says so in the footnote that you pointed me to. So it was

very reasonable for the readers to infer that I'm using the term in its formal sense, in its formal, quantifiable sense and the audience is went for that. The forum where the paper was presented was meant for that. So no, I think the term is very clear.

MR. CHAN: Thank you. Let's mark the next exhibit as Exhibit Number 3. This is the document labeled segmentation analysis in human centric cyber physical systems using graphical lasso.

(Exhibit 3 was marked.)

BY MR. CHAN:

Q Sorry, Dr. Spanos.

Do you recognize this publication?

A Yes.

Q And are you one of the authors?

A I am.

Q And this was also published in 2019?

A I believe so.

Q What is the article about?

A This article -- let me refresh my memory a bit if you don't mind. This is dealing again -- this is in the emergency space. This is dealing

with cyber physical systems. The application here is smart billings are a complicated system that involves not only computational aspect but also human behavior. That's why we call it human centric cyber physical system. And it is paper about data analysis. Using something known as graphical lasso.

Q That explanation is much better than what I can describe to you. There's no page number but several paragraphs above section 6.2 on page 8 of the PDF the photograph that starts with the feature correlations.

Do you see that that paragraph?

A Section 6.2.

Q Right above -- it's that same column, but the first paragraph. That starts with the feature correlations -- yeah, the paragraph that starts with the feature correlations. Do you see that?

A I'm sorry. The feature correlations in figure eight. Is that what you're referring to.

Q I'm sorry. Can you repeat one more time? I could barely hear.

A I'm looking at the entitled 6.2.

Q Right.

A And I'm looking at five lines below that title. The sentence starts with "The feature correlations for $CLUSTER_3$ is shown in figure 8."

Is that what you're referring to?

Q No, no. It's that column, but if you go all the way up starting at line 5.

MR. BOWEN: Alex, is there a way that you can actually share the document using Zoom?

THE WITNESS: No, I actually found it.

(Simultaneous colloquy.)

BY MR. CHAN:

Q Okay. Sure. It's that paragraph. If you count five lines down. That starts with a positive correlation.

Do you see that.

A Yes.

Q It reads:

"There is a positive correlation between morning time and desk light usage indicating somewhat heedless behavior towards energy savings. The absolute energy savings increase during the breaks and finals, given by positive correlation with total points, but it is not significant as

compared to the amount of energy savings that other players in the game exhibit during the game [sic] period, thus increasing the rank."

Now, you use the term "significant" here and I don't see any explanation as to statistics. So the question is why did you use it to describe the amount of energy savings between two groups of players.

MR. BOWEN: Objection. Scope.

Go ahead.

THE WITNESS: It is done in a statistical context but let me explain. The whole term graphical lasso is a fairly advanced method of regression analysis which is of course a formal statistical method. And I believe -- and if I can do a quick search if you don't mind -- if you go to section 6.3, that entitled causal relationship between features you can see again a reference to the 5 percent significance level four lines down so it is defined in a very formal way.

BY MR. CHAN:

Q Where it says a P value lower than .055, 5 percent significance level indicates a strong casual relationship -- casual relationship between

the tested features and implies rejecting the null hypothesis HO.

I do see that.

But going back to the very section I referred you to, it says nothing about the P value. It says about the absolutely energy savings; right that it is not significance as compared to the other amount of energy savings that other groups of players have?

A Correct. But again, in the paper like this, when you use that term and assert something is not asked and answered the readers will expect you're going to show that in terms of formal statistical analysis. I did not have time to review this paper to tell you exactly what is going on. But I think the paragraph that I pointed to, 6.3, says what is the test you have applied to make those statements about significance or lack thereof.

Q But that definition is subsequent to that paragraph. So really at the time of reading this section, the reader will have no idea what that means.

MR. BOWEN: Objection. Mischaracterizes

testimony.

THE WITNESS: That is incorrect. A reader in this forum of a paper like that would certainly know what that means and they would expect to see the definition of that. So no, I would disagree with that statement.

BY MR. CHAN:

Q Okay. Now, immediately after what we just read, it says external parameters play a significant role in energy usage behavior of this case [sic].

Why do the external parameters play a significant role in energy usage?

A Again, significant here means the same definition that I used before, if it's quantifiable established that they do so, now why they do so, it's a matter of this particular experiment. So I don't remember the details, whether the weather or the way people were dressed or many other things might have affected that. This would be external parameters. But they turn out to play a significant role. That's what the experiment said.

Q But here the use of the phrase

what I need to do in order to make that determination.

Q Let's read the next sentence. In other words, the system 300 determines whether the abnormality or fault indication relays to an actual fault.

Did you consider this sentence in forming your opinion?

A I have.

Q And does this offer you the opinion that it clearly indicates what an actual fault is?

MR. BOWEN: Objection. Vague.

THE WITNESS: No, it does not. It tells you that some system determines whether the abnormality or fault indicates relates to an actual fault. That to me implies that somewhere out there is a definition of what an actual fault is and the system sees whether the abnormalities or the faculty indications point to that definition but that definition is missing.

BY MR. CHAN:

Q Dr. Spanos, for a skilled engineer, would there be any issue with respect to identifying whether a fault is an actual fault or

a false positive?

A A skilled engineer -- give me enough context and enough information, and given a specific processes to define things, deciding what kind of hypothesis test I need to do. They may be able to classify the fault. But the faults in semiconductor manufacturing do not simply fall in the category of significant or insignificant. It's much more nuanced than that. So that is my whole problem with the definition.

Q I understand. But my question is a little different. My question is, for a skilled engineer, will there be any issue in terming of identifying whether there's an actual fault or a false positive?

A In a very narrow context with enough information known, I think skilled engineers could do that.

Q For a skilled engineer, would there be any issue with respect to identifying whether a fault is an actual fault or a false negative?

A I have trouble passing that question because a false negative negatively imply it is absence of a fault or at least of a fault

indication so you are asking me whether a skilled engineer in the absence of any evidence, will they see an actual catastrophe happening in saying, oh, my God, we missed the fault. We had a false negative here. Is that what you're asking.

Q That is the question.

A Yes. Again, that's a hypothetical, but yes, catastrophes do happen and sometimes they come unannounced so that is certainly possible. Again in an a narrow context with enough information about the process.

Q Okay. Thank you for your time, Dr. Spanos. Looks like we're almost up to an hour, again. Let me just stop here and let's take another ten-minute break. After the break, I'm going to have my colleague take over because I have to attend so some other personal matters. So let's take a ten-minute break and resume at 4:20.

(Recess.)

--oOo--

EXAMINATION

BY MR. PARKER:

Q So Dr. Spanos, my name is Henrik Parker, Rick Parker, I work with Mr. Chan so I'm going to

"The term ultra-thin resist layers (UTR layer) appears explicitly in only claims 1 and 4."

Isn't it true that the term appears many other times in the specifications?

A Yes. That is true.

Q So when you said it appears explicitly only in the claims that wasn't accurate?

MR. BOWEN: Objection. Misstates the document.

THE WITNESS: The document says not only in the claims but it says in only claims 1 and 4, my intention is to say in the context of the claims, these are the only two instances where you can find this term.

BY MR. PARKER:

Q At the end of the second sentence of paragraph 48, you say -- you say so that UTR layer refers to resist layers having thicknesses that would have been considered very thin at the time of the invention.

Does your use of have in that steps, are you using that in the same way as ultra thin or actually just ultra?

MR. BOWEN: Objection. Vague. Go

ahead, Dr. Spanos.

THE WITNESS: No, this is just a description of what ultra-thin resist are. I use the term "very thin" in comparison to regular resist that are used as a single layer of photolithography. Ultra-thin resist are usually viewed in that context are very thin. So I would --

(Reporter clarification.)

THE WITNESS: So I was just describing it in plain words.

BY MR. PARKER:

Q When you said very thin at the time of the invention in paragraph 48, what did you mean by "very thin"?

MR. BOWEN: Objection. Asked and answered.

THE WITNESS: I meant thinner than what you will have in a resist used as a single -- for a single layer patterning.

MR. PARKER: I'm sorry. Cheryl, can you read back that answer, please.

(Record read.)

///

BY MR. PARKER:

Q In your experience with an ultra-thin resist coating be the same thing as an -- sorry. Let me start over again.

In your experience, would an ultra-thin resist coating be an ultra-thin resist layer?

A Yes, I believe they're used with the same meaning.

Q And that would be true in the context of the '097 patent as well?

A Yes, I think so.

Q In paragraph 49 of your declaration, you say -- the second sentence says claim one does not specifically any resist thicknesses.

Do you see that?

A That is correct. Yes.

Q Does that mean in your opinion that the resist as claimed in claim one could be any thickness and still fall within the scope of claim one?

MR. BOWEN: Objection. Misstates the document. Go ahead.

THE WITNESS: That sense does not mean that. So that's not my opinion.

not agree to that, no.

Q Where in the '097 patent are there ultra-thin resist layers discussed as having thicknesses that are greater than -- or -- equal to or greater than 2500 angstroms?

A In the specification, it states that normal resist for UV lithography is 4,000 angstroms. For regular lithography, it's 5,000 angstroms. And these things that lower thicknesses are considered ultra thin.

Q Where does does it say that lower thicknesses are considered ultra-thin?

A If we can go to the part of the specification. In fact I think it's being discussed in paragraph 52 of my declaration. What I'm stating there in the sentence: The pattern describes a standard resist thickness of 5,000 or more, or 248 nanometer lithography and 4,000 angstroms. I would assume that anything below that would qualify.

Q And why do you make that assumption?

A Well, from my general knowledge about the subject matter and also reinforced by references from the very same inventors in

different patterns that actually freely defined ultra-thin resist thicknesses in that range.

Q Okay. But the question I asked you earlier was, were there any specific statements in the '097 patent describing an ultra-thin resist layer as being equal to or greater to 2,500 angstroms. And is it your position that the one sentence that you just read from column one lines 39 to 43 describes such an embodiment?

A Let me go to column one, lines what again.

Lines 41 to 43.

Q It's the lines that you cited in paragraph 52?

A Yes. I think to me that's a strong indication that this pattern does not exclude the possibility of ultra-thin resist being in those ranges.

Q Okay. That wasn't my question. My question is, is there any discussion in here of an embodiment that is more than -- equal to or greater than 2,500 angstroms?

MR. BOWEN: Objection. Asked and answered.

Go ahead.

THE WITNESS: It's not explicit. There's not an explicit discussion about that.

BY MR. PARKER:

Q If the '097 patent was identical in all respects except that it did not include claim four, would you be able to construe the term ultra-thin resist layer in claim one?

A I have not done this analysis. I did this analysis in the presence of claim four. So I will have to give it some thought before I answer to you.

Q Go right ahead.

A Okay. Your question is in the absence of claim four. Could you repeat.

Q If claim four was not in the patent, so all you had was claim one just written as it is now, discussing an ultra-thin resist layer, would you be able to construe that term as used in the patent?

MR. BOWEN: Objection. Scope. Calls for speculation.

THE WITNESS: Speculation indeed. Right. I would have to think about it. I can

tell you that it's still vague. The definition that I see here -- you know, we know that specifications do not impose limitations that are examples of embodiments? Right. And not having a limitation on claim one, I would still have a single problem. But again, I haven't put in the thought that it deserves.

BY MR. PARKER:

Q In paragraph 57 of your declaration, you discuss a couple of other patents that aren't directly involved in these actions; right?

A Correct.

Q And I believe you were e-mailed those two patents. I'd like you to look at the one -- I think it's entitled DI40-20 -- it says Exhibit 18 at the end of the name. It should be U.S. patent No. 6326319?

A I have it.

Q Was it correct that that was the right file that pulled up that patent?

A You were.

Q And it's got a cover page saying Exhibit 18.

How did you go about finding the two

declaration, I'm looked at column 1, 47 to 50.

Q Okay.

Q Now, if you would turn to that, column one of the 319 patent, Exhibit 4, I'd actually like you to start a few lines earlier at 39 of column one through the end of that paragraph online 45.

A Yes.

Q And this is -- actually.

It's your opinion that the language in column one of the 319 patent, Exhibit 4, as you say in your declaration, identifies an upper limit for UTR thickness of 2500 angstroms?

MR. BOWEN: Objection. Misstates the declaration.

THE WITNESS: This particular patent, to language you had is identical to the language of the patent -- the main patent we're discussing and it specifically says, you know, in so many words -- I don't think it defines the limit. I think it gives us a range within which somebody will call the layer characterized as an ultra-thin. It doesn't not tell us what it is not. It does not put a limit on it.

BY MR. PARKER:

Q But your declaration says it identifies an upper limit for UTR thickness of 2500 angstroms; correct?

A Correct.

Q Is it your understanding that someone construing a claim should not look at extrinsic evidence if the intrinsic evidence sufficiently informs a person of ordinary skill how to construe a given claim for him?

MR. BOWEN: Objection. Calls for legal analysis.

MR. PARKER: I'm asking for his view.

THE WITNESS: I have seen the definition, yes.

BY MR. PARKER:

Q Okay. But my question is, is that your view?

MR. BOWEN: Objection. Calls for a legal conclusion.

THE WITNESS: It's my view whether -- if a patent all all its intrinsic evidence, meaning specification, wrapper, and claims and so on, if it's sufficient, then I should not look for

extrinsic evidence. If that patent informs me completely, yes. The question is that this one does not.

BY MR. PARKER:

Q What is your understanding of the doctrine of claim differentiation?

MR. BOWEN: Objection. Calls for legal analysis.

THE WITNESS: My general understanding, not having legal training is its claim has to add something that other claims do not have. They have to be different. They have to be covering different things.

BY MR. PARKER:

Q Is it your understanding that the doctrine should always be followed when construing claims?

A I do not know the legal answer to that. My common sense understanding is yes, it should be.

MR. PARKER: I don't have any further questions.

MR. BOWEN: I think we should take a break.

THE COURT REPORTER: Off the record?

(Recess.)

MR. BOWEN: So the defendants don't have any questions for Dr. Spanos, but they do reserve the right to read and sign.

THE COURT REPORTER: Anything else?

MR. PARKER: I don't think so.

MR. BOWEN: Not from us. Let me ask the other defense counsel -- does anybody have anything else?

Looks like we don't.

Thanks Cheryl.

Thanks, Dr. Spanos.